Adding developmental trajectories to the DMGT: nonlinear and nonadditive genetic inheritance and expertise acquisition

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Gagné has offered a most impressive synthesis of the developmental literature regarding the giftedness and talent. Given the comprehensiveness of the treatment, it would seem difficult that any commentator would be able to do anything more that tinker with some tangential feature of the model. Nonetheless, I would like to suggest that in future, elaborations of the model should be devoted to the specification of developmental trajectories—how participating factors, components and processes change over time. Especially crucial would be the explicit recognition that these trajectories may assume a far more complex form than specified in unidimensional and monotonic maturation models. Let me provide two examples.

First are the trajectories in genetic inheritance predicted by a recent emergenic and epigenetic model of talent development (Simonton, 1999). According to this model, many talents require multiplicative rather than additive inheritance, that is, the gift demands a distinctive configuration of genetic traits. In addition, the genetic traits do not appear all at once but rather exhibit variable growth trajectories, including growth curves with delayed developmental onsets. This latter possibility is critical because according to a multiplicative model, a particular gift does not initiate development until all genetic components have begun epigenetic growth. Just as crucial is the fact that this model allows for nonmonotonic trajectories, so that talent can be lost as well as gained over time. This curvilinear trend can occur, for example, when some late-developing genetic traits contribute to the talent in a negative manner.

Second are the complex trajectories that can arise in expertise acquisition. Too often researchers in this area assume that ‘practice makes perfect’ and that ‘the more
the better’. Although there may appear a ‘law of diminishing returns’ once perfection is attained, the growth in performance is seen as a positive monotonic function of the amount of deliberate practice. Yet research and theory suggest a much more ambivalent longitudinal relation (Simonton, 2000). For instance, overtraining effects can take place so that beyond an optimal point additional practice can weaken rather than strengthen performance. Indeed, in certain contexts, cross-training in an affiliated domain of expertise may actually enhance talent development more than continued training within the core domain.

The intricacies imposed by these nonlinear and nonadditive trajectories are not merely of theoretical interest. They have practical implications besides. The emergenic–epigenetic model provides the basis for understanding the appearance of late bloomers who might be overlooked by programs designed around the early identification of potential talent. The complications in expertise acquisition imply that training and coaching schemes for talent development may have to be far more nuanced and differentiated than would be expected according to a simple more-is-better conception of deliberate practice. Hence, only when DMGT explicitly incorporates these refinements can it provide the framework for effective programs for the gifted and talented.

References

